

## WHAT IS CLAIMED IS:

1. A method for preparing an intravenous drug in a vial to a patient, the method comprising:
  - providing a disposable cassette having (i) a liquid inlet, (ii) a vial receptacle, and
  - 5 (iii) a chamber;
  - attaching a supply of liquid to the liquid inlet;
  - attaching the vial containing the drug to the vial receptacle;
  - introducing a volume of liquid into the vial; and
  - causing the liquid to flow between the vial and the chamber.
- 10 2. The method according to claim 1, further comprising”
  - causing an additional volume of liquid to be mixed with the drug so as to further dilute the drug.
3. The method according to claim 2, wherein the cassette is provided with a delivery chamber, and wherein the additional volume of liquid is mixed with the drug in the
- 15 delivery chamber.
4. A disposable cassette for mixing an intravenous drug in a vial to a patient, the cassette comprising:
  - a liquid inlet for connection to a liquid supply;
  - a first vial spike;
  - 20 a second vial spike;
  - a chamber;
  - the chamber, the first and second vial spikes, and the liquid inlet being in fluid communication with each other; and
  - a valve mechanism, which may be actuated to control flow between the chamber,
  - 25 the vial receptacles and the liquid inlet.
5. The cassette of claim 4, further including a third vial spike in fluid communication with the chamber, the first and second vial receptacles and the liquid inlet, wherein the valve mechanism may be actuated to control flow to and from the third vial spike.
6. The cassette of claim 4, wherein the chamber is defined by a rigid wall and a
- 30 flexible membrane.
7. The cassette of claim 6, wherein a first conduit leads into the chamber’s upper half and a second conduit leads into the chamber’s lower half, and a groove is defined in the rigid wall between the first and second conduits.

8. The cassette of claim 7, wherein the groove is shallow adjacent the first conduit and wide adjacent the second conduit.
9. The cassette of claim 4, wherein the valve mechanism includes first and second valve chambers disposed respectively in first and second conduits leading to the chamber,  
5 wherein each of the first and second valve chambers is defined by a rigid wall and a flexible membrane.
10. The cassette of claim 4, further including a liquid outlet and wherein the valve mechanism includes an outlet free-flow-prevention valve which is closed to prevent flow through the liquid outlet when the cassette is removed from a control unit which actuates  
10 the valve mechanism.
11. The cassette of claim 10, wherein the valve mechanism includes an inlet free-flow-prevention valve which is closed to prevent flow through the liquid inlet when the cassette is removed from the control unit.
12. The cassette of claim 11, wherein the inlet and outlet free-flow-prevention valves  
15 are permanently closed when the cassette is removed from the control unit.
13. The cassette of claim 4, further including a female luer fitting in fluid communication with the chamber, the first and second vial receptacles and the liquid inlet, wherein the valve mechanism may be actuated to control flow to and from the female luer fitting.
- 20 14. The cassette of claim 13, further including an air vent in fluid communication with the chamber, the first and second vial receptacles, the female luer fitting and the liquid inlet, wherein the valve mechanism may be actuated to control flow to and from the air vent.
15. A disposable cassette comprising:  
25 a liquid inlet for receiving an IV solution;  
a vial inlet for receiving a medication;  
an outlet; and  
an outlet free-flow-prevention valve which, when actuated, is permanently closed to prevent flow through the outlet.
- 30 16. The cassette of claim 15, wherein the outlet free-flow-prevention valve includes a valve chamber defined by a rigid portion of the cassette and a membrane, wherein the membrane includes a folded portion that extends towards the outside of the cassette, so that when the folded portion the membrane collapses into the valve chamber flow is restricted therethrough.

17. The cassette of claim 15, further including an inlet free-flow-prevention valve which is permanently closed to prevent flow through the liquid inlet.

18. The cassette of claim 15, wherein each of the inlet and outlet free-flow-prevention valves includes a valve chamber defined by a rigid portion of the cassette and a  
5 membrane, wherein the membrane includes a folded portion that extends towards the outside of the cassette, so that when the folded portion the membrane collapses into the valve chamber flow is restricted therethrough.

19. A method of delivering a dose of medication to a patient, the method comprising:  
providing a cassette having a chamber having an inlet leading from a medication  
10 supply and an outlet leading to the patient, a manifold providing fluid communication between the medication supply and the chamber, an outlet valve controlling flow out of the chamber, an inlet valve controlling flow between the chamber and the manifold, and an air valve controlling flow of air through the manifold;

moving a first volume of medication from the supply through the manifold to the  
15 chamber;

delivering the first volume of medication from the chamber to the patient;

moving a second volume of medication from the supply through the manifold  
towards the chamber;

urging air through the manifold to force substantially all the medication from the  
20 manifold into the chamber; and

delivering the second volume of medication from the chamber to the patient.

20. The method according to claim 19, further including:

determining whether any air has entered the chamber; and

forcing the air from the chamber into the manifold.

25 21. The method according to claim 20, wherein forcing air from the chamber includes opening and closing the air valve while applying a pressure to the chamber.

22. The method according to claim 21, wherein the air valve is only opened part way.